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Stability Limits of DIII–D Discharges with Strongly Peaked Pressure Profiles[1] E.J. STRAIT, M.S. CHU, J.R. FERRON, R.J. LA HAYE, L.L. LAO, T.S. TAYLOR, A.D. TURNBULL, AND THE DIII–D TEAM, General Atomics, J. ANDERSON, K. COMMER, G. MCKEE, C. REN, Univ. of Wisconsin, Madison, M.E. AUSTIN, Univ. of Texas, Austin, E.A. LAZARUS, Oak Ridge National Laboratory, G.A. NAVRATIL, Columbia University, B.W. RICE, Lawrence Livermore National Laboratory, and the DIII–D Team — Core transport barriers allow improved fusion performance, but the associated steep pressure gradients can lead to large-scale instabilities. DIII–D discharges with negative central shear and strong pressure peaking ($p(0)/< p >\geq 4$) are limited by disruptions to low normalized beta, $\beta_{\rm N} = \beta {\rm aB/I} \sim 2$, but in discharges with broader pressure profiles ($p(0)/< p >\leq 2$) the disruption limit improves to $\beta_{\rm N} >4$, consistent with ideal and resistive MHD stability calculations. The n=1 disruption precursor is located near the radius of minimum q, while localized resistive interchange modes in the negative shear region may also play a role. Recent measurements of the mode structures will be compared to theoretical predictions.

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